GAS BURNER WITH COVERED SIMMER FLAME

SPECIFICATION

FIELD OF THE INVENTION

The present invention relates to a gas burner. More particularly this invention concerns a gas burner having an outer main flame and a smaller central simmer flame.

BACKGROUND OF THE INVENTION

US patent 5,277,576 describes a gas burner comprising a small inner burner centered on a vertical axis and formed with a periphery having a first plurality of outlet ports and an outer burner ring coaxial with and spaced radially outwardly from the inner burner and having a periphery that forms with the periphery of the inner burner an inner annular compartment. The outer ring is provided with a second plurality of outlet ports. An annular element coaxial with the burners and below the outer ring defines an axially extending space communicating with the annular compartment. An air supply in the axially extending space feeds air to the inner burner and includes a plurality of openings formed in the annular element and communicating with the axially extending space and with the inner burner through the compartment. An ignitor plug generates a flame in the burner

assembly, and a thermal element in the compartment controls the flame. A subsidiary gas supply feeds gas to the inner burner, and a main gas supply separate from the subsidiary gas supply feeds gas to the second periphery of outlet ports of the outer ring of the outer burner.

Such a burner can therefore employ the outer ring, whose heating capacity is seven or eight times that of the inner burner, for serious heating of a cooking vessel above the burners. Alternately the small inner burner can be used all alone when it is only necessary to maintain the vessel at a low temperature, for holding its contents warm. It is even possible to use both burners together to apply a great deal of heat to the vessel.

The problem with this system is that the inner burner forms a central hot spot on the cooking vessel. Thus its contents can be overheated and even burned at this hot spot, even when the burner is turned all the way down to the warm setting.

OBJECTS OF THE INVENTION

It is therefore an object of the present invention to provide an improved burner for a gas stove.

Another object is the provision of such an improved burner for a gas stove which overcomes the above-given disadvantages, that is which allows a cooking vessel to be kept hot without overheating the vessel locally.

A further object is to provide and improved method of using a burner.

SUMMARY OF THE INVENTION

A burner assembly has according to the invention a ring generally centered on an axis and defining an array of outwardly open holes and a compartment at the axis. A gas/air mixture is fed to the ring to project jets of the mixture from the holes so that, when ignited, the jets form a main annular flame centered on the axis. A relatively small burner in the compartment is generally centered on the axis, and a horizontal plate on the ring overlies and covers the compartment and the burner. A gas/air mixture is supplied to the burner to the burner to form in the chamber underneath the plate a small flame centered on the axis.

Thus with this system the flame of the small inner burner is not applied directly to the cooking vessel or pot above it. Instead according to the method of this invention the pot is shielded by this normally metallic plate from the flame, so heat is transmitted to it less directly and over the entire surface of the shield plate.

The cover plate according to the invention is a generally circular disk having an outer diameter greater than an outer diameter of the small burner. Furthermore, the disk outer diameter is greater than an inner diameter of the ring.

The plate or shield disk in accordance with the invention is spaced above the ring. It has at least three downwardly projecting and angularly spaced feet by which it stands on the ring. Moreover, the ring has a generally frustoconical upper surface centered on the axis and sloping downward toward the axis and the feet have lower surfaces of complementary shape that sit flatly on the surface. Thus the feet naturally center the disk in the ring without restricting it to any one angular position. The feet form slots or ports through which hot gases, spread over a circle of roughly the same diameter as the outer burner ring, exit then rise around the pot or cooking vessel on the burner according to the invention. Thus the heat from the small inner burner is distributed over a very large surface area.

The shield disk can also, in fact, be unitarily formed with the ring, or at least an upper part of the burner ring. In this case slots for escape of hot gases must be provided in the unitary structure between the ring and the disk.

The disk or plate has an upper surface that slopes downward away from the axis and that has an outer edge. Furthermore, the ring has a generally frustoconical upper surface that slopes downward outward away from the axis and having inner and outer peripheries. The outer edge of the plate upper surface is radially outward of the ring upper-surface inner periphery so that drips from the plate run to the edge, fall therefrom onto the ring upper surface, and run radially outward thereon.

According to the invention a support holds a cooking vessel spaced axially slightly above the plate. This support can be of glass and even transparent so the user can confirm that the burner is lit. Furthermore it can be formed with vertically throughgoing holes. Alternately, the plate has a generally planar upper surface designed to directly contact and support a cooking vessel in this case the upper surface can be perfectly planar and even ribbed.

BRIEF DESCRIPTION OF THE DRAWING

The above and other objects, features, and advantages will become more readily apparent from the following description, reference being made to the accompanying drawing whose sole figure is a side sectional view of the burner according to the invention.

SPECIFIC DESCRIPTION

As seen in the drawing a burner 1 according to the invention has a stationary body 2 centered on an upright axis M and provided with a main gas/air inlet fitting or pipe 3 and a secondary gas/air inlet fitting or pipe 4. The pipe 3 opens into an annular and upwardly open compartment 3a centered on the axis M. Sitting atop the compartment 3a of the body 2 is a lower metallic ring 5a and, atop it, an upper metallic ring 5b forming

an upper downwardly open annular compartment 3b centered on the axis M above and communicating with the compartment 3a. The upper ring 6 is formed with an array of radially throughgoing and outwardly open holes 6 also opening radially inward into the upper compartment 3b. Thus a gas/air mixture supplied to the compartments 3a and 3b from the fitting 3 will exit from the holes 5 and form, when ignited, a large annular flame centered on the axis M and below a lower surface of a pot held, for example, on a support 22 above the ring 5b. This support 22 can be a transparent glass sheet and/or can be formed with throughgoing holes 24.

A small circular burner 9 is centered in a compartment 8 defined within the rings 5a and 5b and is spaced well inward of their inner peripheries. It is connected to the secondary gas/air supply fitting 4 and is formed with an array of radially outwardly open holes 11 that are directed horizontally in a plane perpendicular to the axis M at a level below the uppermost portion of the upper ring 5b, that is within the compartment 8. Thus a gas-air mixture supplied to the burner 9 from the fitting 4 will exit from the holes 11 and form, when ignited, a small annular flame centered on the axis M in the compartment 8. The body 2 below the burner is formed with at least one throughgoing hole 10 for makeup air. In addition there is a radially throughgoing hole or port 19 in the upper ring 5b so that the inner flame from the holes 11 and the outer flame from the holes 6 can ignite each other.

According to the invention the upper ring 5b has a frustoconical surface 15 that is directed axially outward and centered on the axis M and that engages complementary lower end surfaces of feet 14 of a circular metallic plate or disk 12 of a diameter slightly less than the outside diameter of the upper ring 5b. The feet 14 are angularly equispaced and hold this disk 12 up so as to form three vent slots 13 opening in a plane just above the upper edge of the upper disk 5b and angularly equispaced about the axis M. The small flame of the inner burner 9 does not project through these vent slots 13 but, instead, merely heats the lower surface of the disk 12 where it is exposed in the compartment 8, transferring heat to a pot sitting on the disk 12 or above it on the support 22 over a relatively large surface. This allows a relatively large pot, for example, to be kept warm without overheating it locally. In fact the inner burner 9 can operate at about 2.5% of the nominal capacity of the outer burner rings 5a and 5b. The disk 12 can, if necessary, be formed with an array of axially throughgoing holes to increase heat transfer from the burner 9.

In order to prevent spills from getting into the compartment 8, the disk 12 has an upper surface 20 that is frustoconical at an angle of slightly less than 180° and that slopes downward and outward from the axis M, over a rounded upper and outer corner 16 to terminate at a sharp and downwardly projecting lower outer edge 17. In its turn, the upper ring has a frustoconical upper surface similarly slopes downward and

outward from the axis M and that has an inner periphery lying radially inward of the edge 17 and an outer periphery that overhangs the rest of the upper ring 5b and that is vertically aligned with a downwardly curved outer surface 21 of the lower ring 5a. Thus a drip hitting the upper surface 20 will roll radially outward to drop from the edge 17 onto the surface 18 and thence move to the surface 21 and off the burner altogether into a catch pan 23.

The disk 12 can be simply lifted off the upper ring 5b which can similarly be lifted off the lower ring 5a, which can in turn be lifted off the body 2, exposing the burner 9 and allowing these parts 5a, 5b, and 12 to be scrubbed or serviced. The feet 14 center the disk 12 on the ring 5b which in turn fits with its lower edge into a seat on the lower ring 5a that similarly fits in a seat on the body 2, so that the burner can easily be disassembled and reassembled without the use of tools. The three parts 5a, 5b, and 12 are durable metal castings that can be counted on to have a very long service life.